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HOW TO DETERMINE THE ADMIXTURES OF ORGANIC OR INORGANIC SUBSTANCES IN RYE AND WHEAT FLOUR.

(Prize essay of the German Millers' Association, by Dr. L. Wittmack, Professor at the Agricultural College at Berlin)

Translated by THE MILLING WORLD.

II.

THE DERMIS OR SEED COVERING.

INSIDE of the epidermis we find the dermis, much thinner and also made up of two layers. The external layer is formed of compressed, elongated, colorless cells, the internal layer of cells of the same form, but colored yellow or yellowish brown. Both layers have a diagonal direction around the kernel, and cross each other at an acute, sometimes even at a right angle. Both layers are so thin that, viewed from the top, they appear as one; but in a cross section, the outer "transparent layer" can well be distinguished from the internel "pigment layer." The grain derives its color from this pigment layer, which is light yellowish in white wheat, brownish in red wheat and yellowish chestnut colored in rye. Only in one known variety, the "violet wheat," collected by the African traveler, Mr. Hildebrandt, near the Red Sea, is the circular layer of the epidermis the seat of the color, which, in this case, was derived from the liquid reddish-violet colored contents of the cells.

Sometimes we find in the bran a few curious elongated, partially twisted cells, the ends of which are expanded like the bone of the leg in animals, and these cells seem to cover the dermis externally. They are part of the epidermis and the only surviving remnant of the internal cuticle of the ovary, the external cuticle of which forms the epidermis. These cells, sometimes called bone cells, are found more abundantly among rye than among wheat; but their shape as well as their abundance is so variable that they cannot be relied upon as a mark of distinction between rye and wheat flour.

THE STARCH KERNEL.

Everything that is found inside of the pigment layer belongs either to the starch kernel or to the embryo. The former, of course, forms the largest portion. In it we have, immediately beneath the pigment layer, a thin and transparent membrane, which swells when immersed in water. It requires a high magnifying power to see that it is formed of cells, and the history of the development of the grain teaches us that it is the remnant of the seed-bud, in which the whole seed originated.

I. *Gluten Cells.*

Underneath this transparent layer we find the gluten cells, absent only in that portion of the grain where the embryo is situated. These gluten cells form the external part of the starch kernel. They form a vault, so to speak, of radially elongated, strong and thick cells to give solidity and stability to the whole kernel.

In a longitudinal as well as in a cross section the gluten cells are rectangular, or almost square, when seen on the smooth surface; but as found in the bran, they are four, five or six-sided, and wedged together like a pavement. In wheat these cells are generally larger than in rye, and especially the maximum size of wheat gluten cells is considerably larger than the maximum size of those of the rye.

Within the gluten cells we find a fine-grained, nitrogenous substance, the gluten, which is covered by a thin layer of yellowish fat, and it is due to this, that the gluten mostly has a yellowish appearance. The separate granules are known as gluten or proteine granules. Although larger in wheat than in rye, these granules are small at all events, 0.003 mm. in wheat and 0.0015 to 0.002 mm. in rye. It has been claimed that the size of the gluten granules can be utilized to distinguish between wheat and rye flour, but it needs very high magnifying power to measure such minute differences, and in addition to this, the gluten granules in rye often adhere so close together that two or more appear as one and of the same size as the granules in wheat. Besides this we find single rye gluten granules as large as the largest wheat granule, and the difference in size must therefore be rejected as an unreliable mark of distinction.

Gluten granules are not only found in the gluten cells underneath the dermis, for, if that was the case, all the fine grade flours, where this dermis is in its largest part removed, would contain very little gluten and consequently very little nitrogenous, tissue-forming substance. But that is a mistake. Gluten granules are formed everywhere in the internal cells of the starch kernel, only they are hidden from view by the abundance of starch grains. Pluten is a body composed of five different substances:

a. Albumen.

1. Albumen or vegetable albumin. Soluble in water, coagulates by boiling, or with the addition of acids.

b. Caseine.

2. Gluten caseine or vegetable caseine, formerly called vegetable fibrine. Sparingly soluble in pure water; soluble in waters containing potash, or phosphate of potash; insoluble in alcohol. (According to Ritthausen, this substance is absent in rye.)

Gluten-caseine is a subdivision of the vegetable caseine; another subdivision is the "legumin," of the leguminous fruits. The presence of large quantities of phosphate of potash in these latter fruits is necessary for the solubility of the legumin, in other words, for the softening of the fruit during boiling.

c. Gluten-proteine substances (soluble in alcohol.)

3. Gluten-fibrin. Soluble in hot alcohol of 30 to 70 degs. Tralles, and in cold alcohol of 80 to 90 deg. Tr.

4. Gliadin, or vegetable gelatine. Soluble in dilute alcohol up to 60 or 70 deg. Tr. (Absent in rye according to Ritthausen.)

5. Mucedin or vegetable saliva. Of the last three, this is easiest soluble in cold alcohol of 60 to 70 deg. Tr.; more easy yet in warm acohol. It is precipitated from a cold solution by alcohol of 90 to 95 deg. Tr.

The fact that gluten-caseine and gliadin are wanting in rye, may explain the reason why the gluten cannot be obtained by washing from rye flour. We must not forget, however, that investigations about gluten, and all the so-called albuminoid substances of the cereals are very incomplete; they are remarkably difficult because gluten changes so rapidly, and some of the best chemists have labored in vain on the subject.

II. *Starch Cells and Starch Granules.*

Underneath the gluten cells we find the starch cells, which also contain, as before stated, gluten granules, but where the starch predominates. These cells are five or six cornered or irregular, the walls are thick, but of a delicate texture. They are closely filled with starch granules, among which the small gluten granules are lost to sight. Wheat, rye and barley starch granules are alike in substance.

In all of these last-named three cereals, we can distinguish 1) large, 2) small, and 3) composite granules. The large granules are most apparent. They are circular or slightly oval when seen from the surface; if seen edge on they appear narrow elliptical. The small granules are roundish, spherical and *much* smaller in diameter than the large granules, which also vary much among themselves in size. The composite granules are but seldom found in flour, because they are broken up during the milling process; but even in the grain they are not very abundant. They are generally formed of three granules, rarely of more. The separated portions can be determined in the flour by their sharp edges, and this will help to distinguish them from the small granules, which are about the same size.

The large starch granules vary much in size in the same grain. The maximum in the above mentioned three cereals also varies considerably. The maximum size of the large granules is:

In wheat 0.028—0.039 mm. diameter, rarely 0.040 mm.
In rye, 0.020—0.040 mm. diameter.
In barley, 0.021—0.026 mm. diameter.

Consequently the largest granules are found in rye, and an admixture of rye to wheat flour could by this means be easily determined. In addition to this the rye starch granules are often marked internally by star-shaped fissures, a peculiarity, which, although not found in every rye granule, is rarely, if ever, found in wheat starch. These fissures are undoubtedly formed by a varying contraction in the different concentric layers of which the starch granules are formed. These concentric layers are not as apparent in cereal starch as in potato starch. As soon however, as the grain has germinated, and a transformation of starch into sugar has commenced, to feed the embryo, then these concentric layers are *plainly visible*. We can easily see many fissures, breaks, and other injuries in the starch granules, and are able, in this manner, to distinguish between flour made from germinated grain, and flour made from a healthy normal product.

PRODUCTION AND EXPORT OF INDIAN WHEAT.

A report of the Austrian counsel at Marseilles gives the following details on the subject: Indian wheat, almost unknown in Marseilles ten years ago, is an important article at present and able to compete with a few varieties of grain in our markets. The flour made of the softer grains are preferred by the bakers here. With the building of extensive railroads in India tests were made to determine the quality of the soil for wheat culture; small quantities had been grown long since, but the natives always looked upon wheat as an article of luxury. The first shipments at export were carried into England, but proved partially failures, because the grains arrived too late, and neither purified nor classified. But as soon as the shipments became larger and more regular, Indian wheat attracted attention, although is was far behind the American product with regard to purity.

The costs of production and transportation are yet large, for by the time the wheat arrives at London it costs 44sh. per quarter, (480 lbs.).

The Bombay Chamber of Commerce estimates the costs as follows: Price at the place of production, 13 to 14 sh; transportation from the farm to the railway station, 3sh; commission to Indian agents, 4 to 5sh; local expenses, storage, cleaning, bagging and railway transportation to Bombay, 7 to 10sh; reloading and freight to Europe, 11sh. 10d; commission at place of designation, 2sh. 10d.

The export of Indian wheat during the past ten years can be seen from the following table, numbers given in hundredweights:

1873-74	1,755,554
1876-77	2,498,285
1880-81	6,444,449
1881-82	19,863,520
1882-83	14,151,751

It is stated that India can even now supply the markets with 6,500,000 tons of wheat, while a more careful cultivation and low transportation charges would induce the production of twice that quantity. The railroad company known as the "Great Indian Peninsula" had to increase the freight charges last year, on account of the heavy rush of shipments. Other railroads are building and increased competition may have a beneficial result in the reduction of freight charges on the different lines of transportation between the interior and the seaports of India.

ABOUT BOLTING CLOTH.

In view of the many and important improvements made in milling machinery and milling systems within the last few years, it becomes an absolute necessity for the miller to obtain the best and most endurable material for the practical and economic working of his mill, says a writer in the *Allg. Muehlen and Masch. Industrie Zeitung*. One of the most important of these materials is undoubtedly the bolting cloth, and the following short description about the manufacture of this article, which has been employed everywhere with the greatest success, will undoubtedly be acceptable to our readers. The bolting cloth is principally manufactured in Switzerland from the best raw silk, obtained from Italy, which country takes the first rank at present among all silk producing lands. The spinning and beating of the silk forms an important factor in the manufacture of the gauze, and these preliminary manipulations, are, in view of their importance, always performed in the spinning mill. The silk itself is unreeled from the cocoons of the silk moths, of which there are quite a variety, but only the best and choicest species of these insects, which produce the strongest and smoothest thread, are utilized for the production of bolting cloth. The manufacturers are thereby enabled to guarantee the highest possible durability and regularity of the thread and a gauze which is nearly perfection. The silk is reeled from the cocoons in single fine threads, and according to the number of the

gauze, from two to thirty of these threads are united to give the requisite thickness.

A peculiarity of the bolting cloth silk consists in its form and in its close filling. Additional strength is given by a certain amount of twisting to which each individual fiber is subjected before the varying numbers are twisted into the thread which finally makes up the cloth. Common silks loose an element of strength by a neglect of this peculiarity in the twisting of the thread. Many bolting cloth manufacturers use the silk in this latter manner, and this in connection with a less carefully chosen material, enables them to sell the cloth at comparatively low prices, but their products do not possess the strength and durability which is necessary in the milling of to-day. Silk bolting cloth was first manufactured in Holland under the trade mark of "H. Anker Buylgaas." Its manufacture was introduced into Switzerland in 1830, where it at present is in a flourishing condition and has outdistanced the products of Holland by careful improvements in the manufacture. The Swiss bolting cloths are known in every part of the earth, and acknowledged to be superior to any other. Bolting cloth of first quality is woven by hand, and no power-looms, driven by steam or water, can be used in their manufacture. The owners of such mills have always been obliged to engage the best workmen, and these again, knowing that none but first-class materials are used for this article, are always desirous to obtain employment in bolting cloth mills, as they are enabled to produce a perfect cloth with as little difficulty as possible.

BRITISH FLOURING MILL FIRES.

Previous to the modern great improvements and complication of milling machinery, and the enormous increase of capacity in the great mills, flouring mill hazards were small, and mill fires comparatively infrequent, says *The Miller*, of London. In 1875 a notable change appeared in this regard, wherein two large mills were reported as destroyed by fire, at a respective loss of $175,000 and $100,000. Since then the average rate of such losses has alarmingly increased, those reported in 1876 aggregating nearly $214,000. In eleven of these the causes were unknown, four resulted from machinery friction, one from a drying kiln, and the other from grinding husks. In 1877 the total loss by fire was over $358,700. In nine of these the causes were unknown, one was from a lamp, three from explosions, and three were smut-room fires. In 1878 these losses were estimated at $275,000, in twelve of which the causes were unknown, one came from the smut-room, and one from children playing with matches. In 1879 these losses had reached $472,000, eight were from unknown causes, one was by friction, one from wind, one from a dressing machine, and one from an explosion. The losses in 1880 were estimated at about $532,400, sixteen were from unknown causes, and one from explosion, a cause which is now giving rise to much alarm. In 1881 the losses were placed at over $706,000, the highest on record in any period so far mentioned. This was the year of the Macclesfield flour mill explosion, resulting in a loss of $65,000; of the burning of the Leeds co-operative society mills, with a loss of $100,000; and of the Robinsons's mill at Deptford, with a loss of $159,275.

The American milling competition had by this time greatly stimulated the introduction of new machinery. In 1882 the losses were variously estimated at $830,000 and $860,000 The Cardiff mill was burned this year, involving a loss of $125,000; that of the Hughes mill at Belfast, Ireland, at a loss of $200,000; and a Bristol mill at a loss of $100,000. The Spiller mill fire this year originated in a silk machine, as did that of the same mill rebuilt this current year on Feb. 8. Some of the old type mills were also burned this year. An explosion occurred at Rochdale, causing a loss of $175,000; also at York, with a loss of $50,000; and two small mills were burned aggregating a loss of $65,000. The flour mill fire losses in 1883, were variously estimated at $764,600 and at $758,600. The heaviest was the Riverstown mill in Ireland, amounting to $360,000, and the next greatest, the Runcorn Old Quay mill, a steam mill of immense capacity, amounting to $150,000. The reports of 1884 so far promise a full average of the recent years.

The problem of the future, says the writer, is a very difficult one. There cannot be a return to old methods, even if the risks were lessened. The milling engineers must practically and efficiently meet this problem of security, combined with all these immense and complicated improvements. Permanency must be one of the most important objects of their attainment. As matters now are, even if re-employed to rebuild amid the debris of smouldering ruins, they will execute their work with fear and trembling. The mills on the continent are equally feeling the importance of this question, and make, antecedent to the contracts, a guarantee of insurability. The adoption of this plan in Great Britain is suggested as a motive for careful action and study on the part of the engineers.

The importance of this subject is shown by the estimate made of the annual average loss by fire during the past five years, amounting to $675,460, or 2½ cents per sack of flour manufactured. The insurance companies place the proper charge for an annual product of 72,758,148 centals for home consumption at 3½ cents per sack.

INSURANCE RISKS IN MILLS.

The mill risk is not an enviable one, we are told by the *Investigator*. So says the underwriter, as well as the miller, and to the above statement statistics say emphatically, Amen! In view of this fact it is encouraging to note that the millers in this country are exercising more care in the construction of their buildings. According to a journal devoted to their interests it is now customary, "before they give an order for a new mill on lines approaching the modern type, to make it an antecedent condition that the engineer shall show that the mill is insurable on something like reasonable terms in good fire offices." From this it appears that it now lies in the power of the underwriter to take such action as will result in the production of a type of flour mills that will be less objectionable from an insurance standpoint. Let us hope that the underwriter will be so exacting in his requirement that the number of "avoidable causes" of mill fires will be greatly reduced. A millers' mutual insurance company estimates that about sixty per cent. of all mill fires are from avoidable causes, and among these are given broken lanterns and open lights, oily and dirty rags, dirt around steam pipes, and unprotected steam feeds—the latter often resting on wood—poor oils, and waste used in bearings, matches left for rats, etc., lack of system in governing watchmen, careless firemen, millers, and employes. To these may well be added, open stairways, elevators, and hatches with no iron doors as safeguards, no water, buckets, good hose, or other extinguishing apparatus.

CAN WINTER WHEAT BE SUCCESSFULLY GROWN IN MINNESOTA AND NORTHWEST.

The recent statement by the National Agricultural Agent that numerous farmers in the southern part of the State, have turned their attention to the selection of the best variety of winter wheat for seed, preparatory to the planting of winter wheat, in place of spring, has given rise to considerable discussion. Pennock Pusey who, as ex-State statistician, and a gentleman who takes much interest in agricultural matters, was interviewed and expressed the belief that the great difficulty likely to be experienced in raising winter wheat would be the lack of the snowy covering necessary to prevent the freezing of the seed. Mr. Pusey called attention to the erroneous idea so prevalent outside of Minnesota, that from its latitude the State was subject to heavy falls of snow every winter. On the contrary a fall of six inches depth was almost unheard of, and the snow was almost sure to be blown into drifts, leaving many spots comparatively bare. In the country of Southern Pennsylvania, where wheat is almost a staple, the snows of December are supplemented by others throughout the winter months, so that the protecting covering grows constantly deeper, or, at least, the first snow does not disappear before others come to add to its volume. The raising of winter wheat has been carried on to some extent in Minnesota for a good many years. In the Swedish settlement in Chicago county, where fields are protected by surrounding forests and snow is not blown away as soon as it decends; along the Mississippi also, south of St. Paul, where bluffs afford protection, winter wheat has been successfully raised. Some farmers in Southern Minnesota sow wheat in their corn fields after the stalks have been cut off to within a foot or less of the ground. The stalks give lodgment to the snow, and in the spring, before the wheat has reached an appreciable height, can be cut off with a hoe. This involves a good deal of labor, but has been found to pay. The seed is turned into the ground in the fall with a cultivator.

H. H. Young, who is secretary of the Board of Agriculture for the State of Minnesota and representative of the national Bureau of Agriculture, says he has no doubt that the growing of winter wheat can be made a success in the Northwest. Prof. Loring, the national commissioner of agriculture, has of late been making especial efforts to obtain statistics from the Northwestern States in regard to the experiments made by farmers in sowing winter wheat, and Secretary Young has sent out large numbers of circulars—embracing every county in the State—making inquiries upon this particular point. He has received several hundred replies, sufficient to enable him to form a tolerably definite estimate of the acreage for the present year. He says the figures will reach almost, if not quite, 100,000 acres, which is very largely in excess of any previous year in the history of the State. The largest acreage in any one year heretofore has been about 50,000, the general average being 20,000 to 30,000 acres annually. This conclusively demonstrates that the farmers have been successful in their past experiments with winter wheat and have determined to devote a larger portion of their farming lands to its cultivation. The idea seems to have gained currency that winter wheat is only adapted to Southern Minnesota—if it can be called a success in any portion of the State. This is not true. Winter wheat has been sown for the past twenty years in Minnesota—in limited quantities—but it has been confined to no particular section. The acreage has been extended as far north as the line of the Northern Pacific railroad. But the growing of this variety of wheat has been confined exclusively to the wooded sections, or along the banks of the Mississippi river where protection was afforded by the bluffs, and where the snow would remain longer on the ground. Winter wheat has been raised as successfully in the northern portion of the State as in the southern. The opinion has been general though, that only spring wheat could be made to thrive on the prairies, because the snows melted off earlier than in the woods, or drifted and left so much bare ground. This, Mr. Young says, has been proved a fallacy. Experiments have shown that, with anything like a favorable season, winter wheat can be grown in a prairie country. The coming spring will demonstrate this much more satisfactorily—that is, there will be a much larger prairie acreage and a better opportunity to judge by practical results. A number of farmers in the Red River valley have sown winter wheat on a large scale, and many prairie farms have a goodly proportion of acreage devoted to the same purpose. Several varieties of wheat have been sown and properly marked, so that it may be known just what variety thrives best. The experience of many farmers who have sown both winter and spring wheat has shown that the former, under favorable conditions, yield better. Of course these illustrations have been on a comparatively small scale, but it is confidently expected that by the time of the coming harvest there will be reliable data to conclusively establish the success or failure of winter wheat raising in the Northwest. Mr. Young does not place much reliance in the raising of this wheat on the prairies a long distance to the west and north of St. Paul, but he has every reasonable assurance that success will crown the efforts of farmers, at least in Minnesota, in this direction. He cannot see why winter wheat cannot be grown just as well in Minnesota as in Michigan, and he is certain that the experiments, to be made on a larger scale than ever before, will prove that Minnesota's soil and climate are adapted to the successful raising of wheat from seed sown in the late fall.

A FRENCH WHEAT CLEANER.

At the recent Nice Exhibition was a machine shown by M. A. Maurel, of Marseilles, we are told by the *Scientific American*. In the upper part of this machine is placed a hopper immediately over a cylindrical and open topped receiver. Horizontal stirrers on a vertical shaft work in this receiver, motion being given by bevel gearing and a pulley driving off the main shaft of the implement. The wheat to be treated is fed into the hopper and falls thence into the cylindrical receiver beneath, where it is subjected to the action of water delivered at a sufficient pressure to keep the sound wheat at the level of a discharge opening in the side of the receiver, the stones and heavy impurities falling to the bottom, and dust, shaff, etc., floating to the top, where they pass off by an overflow. The sound wheat being carried, as described, through an opening below the water level, is taken with the steam along a slightly inclined trunk rectangular in section, and in the bottom of which is set a series of catch plates to receive and hold any stones that may have been brought over with the wheat. From this trunk the wheat falls into the bottom of a vertical drying cylinder, after having been previously separated from a part of the water by means of a centrifugal fan. The drying columns, of which there are one or more, have perforated sides containing a series of inclined blades mounted on a vertical shaft and driven at a considerable velocity. By this means the weight is raised to the top of the first column, where it passes out by a discharge to the bottom of the second column, and is again raised, by which time the operation of cleaning and drying is supposed to be complete.

DANGER AHEAD.

"The freest government," said Daniel Webster, "cannot long endure when the tendency of the laws is to create a rapid accumulation of property in the hands of the

few, and to render the masses poor and dependent." Is not property accumulating in the hands of the few, and are not the masses fast becoming poor and dependent? The wealth of Vanderbilt and Gould far exceeds that of Crœsus or Marcus Aurelius. Men are not considered very rich whose wealth does not exceed $10,000,000. Nor have these enormous fortunes been gained by legitimate trade. They are the results of speculation or monopoly. Often this speculation has been in breadstuffs, "corners," (which are crimes by our old common law), as in the case of Armour Brothers, who made, in one year, $7,000,000 by a "corner" in pork. Fully as often this wealth is the fruit of monopoly (another crime by our common law), as in the case of the Pacific Railroads and the Standard Oil Company.

Do we realize how rapidly wealth is gravitating into the hands of the few? Twenty-five years ago the richest man in the country was not worth above $10,000,000. When old Stephen Girard died he was the wealthiest man in the United States, and he was not worth more than that. When Commodore Vanderbilt died his estate was estimated at $75,000,000, and the estate of A. T. Stewart, a few years thereafter, was rated at $50,000,000. These were then the richest men in the country.

But what of the other side? Take Boston, the center of culture, the pride of Puritan New England. Consult the report of the Massachusetts Bureau of Labor Statistics. In Boston there are 30,000 women who live by sewing. Their average weekly wages do not exceed $2.75. Paper box makers average $3 per week. Machine girls make more, perhaps a dollar a day; but the work induces spinal disease, and in two years breaks them down. They work ten hours per day. They live on dry food, and perhaps a little weak tea, and sleep in miserable, filthy quarters. Steady work just keeps soul and body together; lack of work means either starvation, beggary, or shame.

Do the laws favor this? Where is there one that opposes it? Note the fate of bills in opposition to it that come before Congress. If they provide for the giving back to the government, lands forfeited by powerful railroad corporations, they are amended till they have but little force; if to compel another railroad to provide a sinking fund to pay its indebtedness to the government, they are so framed as to put the matter entirely in the hands of the corporation. When settlers attempted to occupy certain lands claimed by a California railroad, the Supreme Court decided that the lands belonged to the railroad; shortly afterwards, when the state of California attempted to tax this railroad for these lands, the same court decided that the lands did not belong to the railroad. It is notorious that laws are so framed, so interpreted, and so enforced as to favor the accumulation of riches, even by unjust means, and to make poverty the lot of the many.

With these facts before us the words of Webster have a deep significance. They are the expression of the deep conviction of a statesman, after a thorough study of history. We belleve that the laborer is worthy of his hire; we believe that superior labor should receive superior pay; we hold that property, rightly won, should be held as sacred in law as liberty or life. We know that by the natural course of events some earn and save more than others, and what thus becomes theirs they should hold inviolable. We abhor communism; we believe that the work of the hand or head should be paid all it will bring in a free market; and we abhor the teachings that the trader, the man of necessitous convenience, should not be reasonably paid; but we do say that speculators, monopolists, and stock jobbers are public robbers and legalized thieves; and it is a shame that the tendency of law is to favor their work. It threatens the prosperity of the people and the existence of our government. It is high time that we gave serious consideration to the warning words of Webster, and that some efficient means should be devised to correct these evil tendencies.—*Rural New Yorker.*

THE TRANSPORTATION QUESTION.

The adoption of even the strictest system of inter-state regulation of commerce will never solve the transportation question for the western farmer, says the Iowa *State Register*. No rule or regulation which would be just to the railroads could so cheapen the transportation of our bulky produce to the seaboard as to be profitably borne by the producer. No process has yet been devised for moving so far the product of the farm in its gross condition. So our farmers need not be waiting for that better time foreshadowed by the plan so ably presented to the American Congress by Senator Wilson. They must be accommodating their farms to a system of condensing the products to the smallest bulk possible. Wheat corn, hay, potatoes, etc., cannot be transported to distant markets. We must either bring mechanics and manufacturers among us to consume at home these bulky products, or we must convert them into such articles as will stand transportation, and yet yield profit to the producer.

Let us illustrate by the actual facts in the experience of Kansas and Nebraska, during the past year. These two states, for the first time, had immense corn crops, which they could not consume at home. Those states in 1883 produced, carefully estimated, 274,000,000 bushels of corn. Of this 137,000,000 bushels supplied the entire home demand, leaving for transportation to market the same amount. We have not the data for the charges on corn from the various railroad stations in those states to Chicago, consequently our figures will fail of much of the force that they would have if we could get the full cost of the transportation of this 137,000,000 bushels of corn from its start to its final destination. But during the time of the shipment of this corn the Chicago, Burlington & Quincy road charged 20 cents per 100 pounds of corn from Kansas City to Chicago, and from Omaha 25 cents. And it is fair to estimate that the average from the various parts of those states to Chicago would be at least 35 cents per 100 pounds. This would make the transportation on this 137,000,000 bushels $26,852,000. And, if it be continued to New York, there would be added half as much more.

If this corn had been converted into pork, at the calculation that one bushel of corn would make ten pounds of pork, in this shape there would have been 1,370,000,000 pounds for shipment, or 685,000 tons, or 68,500 car loads, which at $70 per car, the price from Omaha the past year, would be $4,795,000. This would show a saving to the farmers of those states in the transportation of their surplus corn crop for one year of $22,057,000. This is an immense sum, and yet it is indisputable. But if we had the exact figures at which the 137,000,000 bushels of corn were disposed of, as well as the 68,500 car loads of pork, it would show a still larger balance in favor of the farmers of those states. There is but little doubt if that corn had been wisely converted into pork, beef, mutton, butter, horses or mules, but the net proceeds after transportation to market would have been at least $50,000,000 in favor of the producers over selling the corn. It is true the railroads would not have as much or as profitable a business. But they too, must learn to economize in expenses, in salaries, and in the careless destructien of railroad property.

But this question is not merely for Kansas and Nebraska, but for the farmers everywhere in such localities as are productive of grain and grass. Not another bushel of grain should ever go out of the states so well adapted to the production of all classes of stock and of the various kinds of food suited to their rapid and full development. In this way, and this only, can the farmer solve the transportation problem favorably to his own pocket.

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New buildings and new modern milling machinery. Patent rollers for making new process flour. Also two run of stone for rye flour and feed, all in complete working order. Large local trade. Situated on line of railroad. Inquire of FIRST NATIONAL BANK, Fishkill Landing, N. Y. 811

FOR SALE CHEAP.

One 6-horse power engine and 10-horse power boiler. all complete, price, $350; one 8-horse power engine and 10-horse power boiler, price, $375; one 10-horse power Portable complete, price, $350; one 10-horse power Russell Traction, price, $500; one 4-horse power vertical engine, price, $120. Call or address for particulars EZRA F. LANDIS, Lancaster, Pa. 262

MILL FOR SALE CHEAP.

Situated in the town of East Bloomfield, Ontario Co., N. Y. Mill has 3 run stone and all machinery for doing first class custom and merchant work. There is eight acres of land. Good house, barn and plenty of fruit, the mill is driven by spring stream that never fails. Situated ¼ mill from depot. Reasons for selling ill health. Those wishing to buy mill property would do well to see this. BURRELL BROS, East Bloomfield, N. Y. 811

FOR SALE.

FOR SALE.

Water mill at Whitehall, Trempenham county, Wis. Mill built in 1878. Five run of stone. Mill easily converted into roller mill. Plenty of water all seasons. Good custom trade. Can command trade of Wisconsin Pinery. Home demand for all. Wheat supply from first hands. Mill forty rods from Depot. Side track to mill can be procured. Whitehall is a thriving town and county seat. Good reasons for selling. Address, WHITEHALL MILL CO., Whitehall, Wis. 7tf

AN EIGHTY BARREL ROLLER MILL FOR SALE.

I offer for sale two-thirds interest in the "Ashley Roller Mill." The mill is doing a big business, and is making money. Located on railroad track. Good shipping facilities for shipping direct from the mill into cars. Situated in the heart of a good, long-berry wheat section. Reason for selling: I want to build on a larger scale at some other point. No mill within ten miles. For terms and particulars address J. B. MILLER, Ashley, Ohio. 89

NIAGARA MILLS TO RENT

For a term of years. Having seven run of stone and machinery for flouring. Is very conveniently located in the City of Lockport, N. Y., on the Erie Canal. Operated by a Leffel turbine. Buildings of stone, slate roofs, ample storage capacity and good water power. Wheat taken directly into the mill from boats, also from teams. Prospects for a large crop of wheat good. Two railroads can take flour in any direction. This is the time to get ready for grinding the new crop. Terms liberal. Apply to L. A. SPALDING, Lockport, N. Y. 812

MILL FOR SALE.

MILL FOR SALE.

I want to sell one-half interest in the "Brick City Mills" and water power. Mill building is of brick, 40x80 feet in size, and six stories high. Fitted out complete with seven sets of rolls and four pairs of burrs. Thoroughly repaired last August at a cost of between $4,000 and $5,000. Turkey river is here 200 feet wide, with rock bottom and sides, making one of the cheapest powers to maintain in the state. The power is double the amount ever used. Price for half interest is $11,000. Address J. G. BOTSFORD, Clermont, Iowa. 913

SALE OF MILL PROPERTY.

The undersigned will on the 19th day of July, 1884, sell at public sale on the premises, a valuable custom water mill, situated at Perkinsville, Madison County, Indiana, about twelve miles west of Anderson and twelve miles east of Noblesville. Good pike leading to each place. There is now in the mill three-run of burrs. Water power is sufficient to run mill with capacity of 100 barrels in twenty-four hours. Mill is frame and four stories high, situated in excellent wheat and corn country and doing good business. Cause for selling, owner is dead. For particulars, address the undersigned, at Perkinsville, Madison County, Indiana. GEORGE V. ZELLER, Administrator. 911

YOU CAN BUY THESE CHEAP.

1400 4x3 elevator cups. } made by W. P. Myer,
1300 4½x3½, " " } of Indianapolis, Ind.
One No. 3 Excelsior Centrifugal reel.
One " 1 J. T. Walter Middlings Purifier.
One " 2 " " "
Four McCully Corn Cob Crushers.

Each of the above articles is brand new, in perfect condition, just as they left the factories, never having been unboxed, and will be sold very cheap for cash, the owner having changed his plans, has no use for them. Address S., 30 care THE MILLING WORLD, Buffalo, N. Y. tf

VALUABLE MILL PROPERTY.

Roxbury Mill, on Antietam River, for Rent or for Sale on easy terms. This property comprises a most desirable flouring mill in complete order with three run of burrs, excellent and never-failing water power, 23 acres rich land, good two-story dwelling house, situated one mile northeast of Breathedsville, on Washington County railroad, and five miles southeast of Hagerstown, and on the road leading from the Hagerstown and Sharpsburg pike to the Hagerstown and Boonsboro pike, in as fine and healthy agricultural district as can be found. A full supply of wheat can always be had by wagons, direct from farmers in the neighborhood. The mill has always had local custom for all the mill feed and much of the flour made. For terms, &c., apply to GEO. T. GAMBRILL & CO., Baltimore, Md., or F. F. Mc COMOS, Attorney, Hagerstown, Md. 614

"GRAND VALLEY MILLS" FOR SALE.

At Triplett, Mo. Mill building is 28x30 feet and four stories high. Built by G. & W. Todd & Co., of St. Louis, Mo. It has one pair of 3½-foot stones for wheat; one pair 30-inch, for corn; a two-reel chest, 24 feet long; a No. 4 Martin's centrifugal reel; a No. 1 Smith purifier; a Eureka smutter, and a corn sheller. All new and in good running order. Engine room, 18x28 feet. Engine and boiler built by the Erie City Iron Works. Engine, 12x20; boiler, 38 inches by 12 feet, tubular; all new and in good order. Located in the town of Triplett, Mo., 75 feet from Wabash railroad track. Town contains about 700 inhabitants. Mill has a good local trade established, and in a good wheat-raising district. Abundance of water, and fuel plenty and cheap. All the facilities for doing a No. 1 business. Satisfactory reasons given for selling. A good opening for a practical miller for doing a good business. For terms and price address MADDOCK & SHIPP, Triplett, Mo. 912

The MILLING WORLD and CHRONICLE of the GRAIN and FLOUR TRADE.

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ADVERTISING.

Card of Rates sent promptly on application Orders for new advertisements should reach this office on Tuesday morning, to insure insertion in the week's issue. Changes for current advertisements should be sent so as to reach this office Saturdays.

EDITOR'S ANNOUNCEMENT.

Correspondence is invited from millers and millwrights on any subject pertaining to any branch of milling or the grain and flour trade.

Correspondents must give their full name and address, not necessarily for publication, but as a guarantee of good faith.

This paper has no connection with any manufacturing or mill furnishing business. Its editorial opinions cannot and will not be influenced by a bestowal or refusal of patronage. It has nothing for sale, but its space to advertisers and itself to subscribers.

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THE GLORIOUS FOURTH.

"The Chief of Police of Philadelphia has issued an order prohibiting the firing of crackers, squibs, etc., within the city limits on the Fourth of July. A like order ought to be issued in every city, town and village in the country. The use of fireworks in cities and towns on the Fourth of July is simply an unmeaning piece of nonsense, and exceedingly dangerous both to life and property. We again call upon the Mayor and proper authorities of this city to enforce the law upon that subject."

We clip the above from our contemporary, the *Cincinnati Price Current*. In the abstract Mr. Murray is right. The use of fireworks in cities and towns is fraught with more or less danger, but does Mr. Murray forget that he was once a boy? We are a gray-headed, broken-down, old man, yet we should sadly miss the startling fire-cracker, the unexpected torpedo, the grotesque devil-chaser and the brilliant, incomprehensible sky rocket, on the anniversary of this glorious Republic's birth were their use entirely prohibited. The small boy delights in noise; let him make it once a year. We realize fully the danger to which certain property may be exposed, and we realize also that the average Yankee boy would lose much of patriotic enthusiasm were he debarred from giving it expression in the way of fire-crackers, squibs, etc. Picture to yourself Mr. Murray, the entire Yankee boy nation sitting calmly down on the glorious Fourth, while listening in open-mouthed astonishment to the Declaration of Independence, and the speeches of half-fledged attorneys, eulogizing the valorous deeds of the revolutionary heroes, while picturing in all the glowing colors of language the scenes of struggle, triumph or defeat through which this country passed before its independence became a reality, imagine the boys growing enthusiastic on church festival lemonade, or inwardly resolving to "stand by the old flag" after partaking of picnic ice cream.

It may be urged that the firing of pistols, crackers, etc., has little to do with patriotism, but the boy associates this day of annual license with the act of which it is commemorative, and unconsciously imbibes a love of country therefrom. As a rule boys are thoughtless, and careless, but cannot some means other than entire prohibition of this source of pleasure be devised to render the day less hazardous to life and property? Let us, while comprehending in the fullest degree the danger to which life and property is exposed on this day of powder and fun, not forget that we were, long years ago perhaps, boys, and as such anxiously looked forward to, and saved our money for, the Fourth of July. If the fire-cracker must go, let us devise some other means of rendering the day enjoyable and memorable to the small boy who never thinks, but who in after years may be called upon to do deeds of valor for the country whose birthday he now hopes to celebrate in the time-honored manner.

BOUND to keep up with the procession if it takes a leg, our estimable and venerable, if somewhat wishy-washy, New York contemporary has added to its staff a funny man, and this is his maiden effort.

THE MILLING WORLD objects to the discussion of the relative merits of porcelain and chilled iron. THE MILLING WORLD probably could not tell the difference between the two, and if it could, lacks the grit to make an assertion.

Our opportunities for acquiring a knowledge of the merits of porcelain and chilled iron, as material for roll surfaces, are inferior to those possessed by our contemporary, for we, alas, possess no "Permanent Exhibition," but if, with this great advantage, our e. c. cannot yet tell which side up a centrifugal reel should stand, *vide* his issue for June 11, then we have nothing to regret. THE MILLING WORLD did not object to the discussion of the subject alluded to; it simply suggested, in the mildest possible manner, that some other matter might be more profitably and intelligently discoursed upon. It ventures still to incline to that opinion, because this question of porcelain and chilled iron was, several years ago, worn threadbare, without profitable result to the journal discussing it, or the unhappy reader upon whom it was afflicted. Under certain conditions there can be no question that the porcelain roll has advantages over the chilled iron, while under other conditions the chilled iron roll is the superior. Every practical miller of extended experience knows this, and every builder of roller mills will, we believe, admit it. Messrs. Allis & Co., of Milwaukee, are the only manufacturers of porcelain rolls in the United States, so it is not presumable they require this discussion to keep alive the interest in these machines. They also are among the largest builders of chilled iron rolls in this country. We have had no expression of their opinion, but believe it will coincide with our own, viz: existing conditions influence the value of either. We would give a cent to know the gentleman who penned the funny paragraph which has served us as a text, and will recklessly wager a bottle of pop that he is in total oblivion as to the size of the sand bag possessed by THE MILLING WORLD. The charge that this journal lacks "grit" is excruciatingly comical, and it has so taken our fancy that we give it circulation among our dusty friends who might otherwise be deprived of the privilege of applauding a budding funny fellow.

FROM all we can learn there is a good deal of unnecessary "cutting" being done by some builders of, and dealers in, milling machinery; we say unnecessary, because we do not believe any more sales are effected by cutting prices than there would be were values maintained at a level that would permit a fair and just manufacturing profit. Builders of flour mill machinery have enjoyed a season of activity, profit and prosperity, such as few, if any other, lines of industrial pursuit can rival, and it is natural that a season of inactivity should sooner or later be experienced. The business of mill building, enlarging and remodeling, has for a number of years been run at high pressure, while of late there has been little if any profit in flour milling. It was time therefore to call a halt, and this has been done. The endeavor to force sales of milling machinery during the present dullness of the flour trade, by reducing prices below a profitable level, we can but consider an unwise policy. It is easy to lower values, but difficult to again advance them, and if this policy becomes general, it can but result in lowering the quality of the goods placed on the market. Such a result would be deplorable, and is not pleasant to contemplate. True, much of the material entering the construction of milling machinery has declined in price, as in many cases has the cost of labor, but not to the extent which some sales of machinery would warrant. It is far better to make few sales at a fair profit, than many sales without profit. The effort to extend one's business by an indiscriminate slashing of prices, indicates one of two things: either exorbitant values have hitherto ruled, or the one who seeks to build up and increase his business in this manner, is but building a pit into which he will ultimately tumble. Millers whose necessities compel them to put in additional machinery are amply able, and entirely willing, to pay for what they want. The effort to extend trade, and induce millers to purchase what they do not yet want, by cutting prices below a profitable level is to be deprecated.

THE failure of D. L. Wing & Co,, recorded in another column, is the first large failure in the milling line, which may be traced to dull flour markets, in several months. Despite the fact, however, that low prices for flour have so long prevailed, there does not appear to have been so great a degree of inconvenience experienced among flour manufacturers, as in other branches of trade. Whether this failure is to be the precursor of others, of course cannot be determined, but from the circumstances surrounding it we should judge it will have no effect upon the trade. From what we can learn there has evidently been an attempt to do a large business upon insufficient capital, resulting, very naturally, in these times of stringency, in failure to make both ends meet. It is stated that the Planet mills, located at Litchfield, Ill., represented an investment of $400,000. Upon this there is a bonded indebtedness of $225,000. Outside of this the liabilities are variously estimated at from $120,000 to $170,000. All, or very nearly all, of the indebtedness is to Eastern parties, St. Louis banks having extended little accommodation without ample security. Messrs. Wing & Co. endeavored, unsuccessfully, to work up a demand for their output in St. Louis, and were obliged to content themselves with eastern and foreign markets, which latterly have not been remarkable for margins of profit. It is perhaps possible that Mr. Wing would have pulled through all right had he not gone into building a railroad for convenience of shipping the mill's products. It is further stated that during the only paying month of last year, October, the mill broke down, and for a period of thirty days lay idle, involving a loss of $30,000 on contracts. The matter as a whole seems to be in a complex condition, but it is asserted that no one will lose a dollar by the suspension, which it is said will be but temporary.

OUR valued contemporary, the *Boston Journal of Commerce*, touches upon a subject which should be brought to the attention of every business man, and that is the failure to return to their owners letters of recommendation accompanying applications for employment. Such letters oftentimes are filed away in the anticipation that the near future may present an opening for the applicant, and then his eligibility may be intelligently considered, or the position for which application has been made may have been filled, and the application, with the letters accompanying, are put carelessly or thoughtlessly aside, and become lost or destroyed. This is not right. As our contemporary says: "Employers seeking help should remember that recommendations once earned and secured by young men are highly prized by them until they have earned a reputation and made a name for themselves; and when recommendations are enclosed with an application for a position, they should be in all cases promptly returned, and not thoughtlessly dropped into the waste basket as of little value, for they are of great value to their proper owner. The writer has gone through all this in detail, and knows whereof he writes, and can show a large bundle of such documents all written over twenty-five years ago, and they still have a value in aiding to trace out events in manufacturing history in days gone by."

OUR Canadian neighbors we judge are dissatisfied with the workings of a part of their tariff system, for we learn that at a recent meeting of the Toronto Board of Trade, H. N. Baird gave notice of a motion that as the Board was satisfied that the milling industry of that country labors under a most unnecessary and unfair disadvantage whenever the wheat crop of Canada is less than the consumptive requirements of the country, and being satisfied that this disadvantage is due to the tariff discriminating in favor of the American manufacturer of flour by imposing a duty of only 50 cents per barrel on American flour, whereas the duty on American wheat is 15 cents per bushel, or equal to 71 cents per barrel, thereby making it impossible for the Canadian miller to compete with his American rivals: it was

Resolved, That, as the principle of the Canadian tariff is avowed to protect the Canadian manufacturer, and as it markedly fails in this particular, this Board do memorialize the Government to rectify the injustice by at least equalizing the duties on American wheat and flour, so that the American miller will not have an absolutely protected advantage from the operation of the Canadian tariff.

This motion is to be discussed at the next meeting of the Board.

THE Bureau of Statistics reports the arrival in this country, during the month of May, of 82,581 immigrants. Of this total number, there arrived from England and Wales, 6,735; Ireland, 14,163; Scotland, 989; Austria, 2,424; Bohemia, 1,589; Belgium, 123; Denmark, 1,928; France, 336; Germany, 28,279; Hungary, 1,303; Italy, 3,405; Netherlands, 706; Norway, 4,368; Russia, 1,819; Poland, 1,218; Sweden, 5,456; Switzerland, 1,260; Dominion of Canada, 5,800; and from all other countries, 680. All these people will require more or less bread, (some of them undoubtedly will get less) and if we can only induce sufficient immigration, our mills may all run full time for a while.

ALL crop reports are of a favorable character, and, where the wheat harvest is in progress, reports of yield and quality are of a satisfactory nature. It seems hardly probable now that injury will be done the wheat crop, and while the probable yield can only be estimated, such estimates can be more closely made day by day. We shall watch with considerable interest for the advance in prices, which some of our contemporaries assert will be experienced soon after the opening of the new crop year.

COMPETITION AND INDUSTRIAL EDUCATION.

AN interesting lecture on this subject was recently delivered by Prof. Graff at Vienna, and from a report in the *Oester.-Ungar. Mueller*, we translate the following: Competition is a natural phenomenon, and originates as such, at times, in the necessity of self-preservation, at times from a desire to rule certain districts, to be conspicuous or to satisfy the ambition. But competition is also a result of liberty, and especially of the liberty of commerce. As we meet the idea of competition under a varying number of names, it may be well to define it. If, for instance, invitations are sent out to participate in an exhibition, competition is a noble struggle between civilized nations, a friendly battle in the fields of progress, and destined to elevate mankind from thraldom.

In its every-day conception in connection with ordinary business routine, however, competition is the curse of the nineteenth century, and the ruin of all honest aspirations. And yet, for all that, it is a plain natural necessity, deeply rooted in the laws of mankind. We meet it not only in commercial, but also in social life. We find it on the battle field as active as in the schools, in high as well as in low life; in fact competition is universal in nature, in the animal as well as in the vegetable kingdom.

The naturalist calls it "struggle for existence." He teaches us that no organism can claim as its own the space it occupies or the light and the air which it uses, but that other organisms, feeling the necessity to live as well, are constantly trying to crowd the weakest out and to take its place. We know that generation upon generation of plants and animals have died in this struggle for existence, and we find their remains buried beneath soil or rocks. In the same manner we know of plants and animals which are slowly, but surely, disappearing from the face of the earth, and whose remains will be designated by future generations of men as belonging to extinct organisms. But many forms are found which, in this constant struggle for existence, are forced by necessity to accommodate themselves to the changing conditions of their environment in order to live and to perpetuate their kind. Many insects, whose color is the same as the color of the plant upon which they feed, are in this way protected against the attacks of their enemies, and it is as yet an open question whether nature has not wrought this change in accordance with a certain consciousness on the part of such insects. Many animals manage to escape from their hungry enemies by a display of cunning and deception; plants, during growth, know how to obtain the largest possible share of sunlight, and it is demonstrated that plants as well as animals can be acclimatized, can become habituated to the varying conditions into which they are placed. The struggle for existence is carried on all through nature in a constant battle between species and individuals; but in the ever-changing aspects of the phenomena we see that those survive whose organization is best adapted to live under the present condition.

The competition between men is merely a counterpart of nature's working; it is not an artificial production, but simply a peculiar phase of one of nature's laws. Admitting this we are neither able to do away with competition, nor to withdraw ourselves from its inflnence; but we can imitate animals and plants, and adapt ourselves to our environments or change the conditions by superior intelligence, and thus be enabled to survive in the struggle for existence.

Nowhere is competition carried on more lively than in commerce and industry. If we look, on the one hand, upon competition as a natural outgrowth of life and therefore as something good and just, we cannot blind ourselves to the fact that, on the other hand, greed, envy, deception and other human faults, have a tendency to distort and disfigure this fair law of nature. Such proceeding has, of course, a tendency to make the struggle more disagreeable and fierce, but it does not justify us in denying the privilege of existence to a natural competition. If we find it abused and degraded by human faults, all there is left for us to do, is to fight against this degraded prototype with all available and lawful means. To do this successfully we require knowledge and experience, derived from continuous education, a legacy which we are bound to secure to our children by industrial training.

This is not the place to speak about the peculiarities of mind and character, necessary for a successful business management; we can only refer to a few practical points. First of all, it is necessary that everybody should know his business thoroughly, not only know what is necessary for it, and how things are to be done, but be able to do it himself; in addition, not only know the manipulations of making it, but also the reasons why it is made so and not otherwise, tools as well as machinery. This "why" forms the philosophy of the matter; it simplifies the common things, it grades the transition between simple and complex or novel phenomena, and permits the application of available advantages and the discovery of new ones. Such knowledge refines labor, it represents the boundary line between the trained animal and the thinking man; it enables us to work to advantage first at one article and then at another, and to comprehend things that we perhaps have never seen.

History teaches us that there are periods of advance and of stagnation in the life of all nations, and that that race has the advantage which is able to comprehend its condition and strives to counteract the period of stagnation. During the first great international exhibition at London in 1852, the English people found to their great consternation that the products of their industrial art, although strong and well made, were poor and unattractive in form, and altogether unable to compete with the French products. They forthwith went to work and inaugurated an industrial art school, in connection with a museum and a collection of ancient and modern objects. The result was that the form and appearance of the British products improved very rapidly, and, giving due consideration to the national taste, were soon able to compete with the products of other nations.

The French have always been masters in the production of easy and graceful forms, and this has enabled them to lead in this field, and all the rest of the world, acknowledging this superiority, was willing to purchase their products. The ready market enabled them to obtain ways and means to keep their wares up to the standard of beauty. The French manufacturers, in addition to the above advantages, were assisted by collections, museums, and other State institutions. But, we ask, what has enabled the French people primarily to produce the beautiful products of industrial art? The largest part of this is due to the inherent wealth of the country, something which has always been, and undoubtedly always will be, missing in the development of Austria or Germany.

The Austrians had their eyes opened at the International Exhibition of Paris in 1867, and were obliged to acknowledge that their industrial art was in anything but a first-class exhibition. The formation of the beautiful museum of arts and industry, was the result of this knowledge, and we can see to-day what immense advances Austria has made since then in industrial art.

In 1876 at Philadelphia the Germans received their sentence by one of the leading judges of the exhibition, that their products were the meanest and poorest of all the exhibits. Of course they did not like to acknowledge this publicly, but secretly they took the steps necessary for improvements in this line, and to-day the industrial art of Germany is as highly developed as that of Austria, greatly to the mortification of the French, who are to-day obliged to acknowledge the English, Austrians and Germans as successful competitors. Here we have an example of great international competition, a competition based entirely upon industrial education, upon the advantages offered to certain classes of the people. Here is a striking illustration to show that the work had not been useless, but successful, and that a good deal can be done with a firm will. If we have to-day attained the necessary education about forms and colors, we cannot yet claim the same standard with regard to quality of material, construction and workmanship, and the question has often been discussed, whether an article should have the privilege of beauty, before having attained that of solidity.

With the exception of a few of the industrial arts, such as locksmithing, bronze manufacture, carriage building, etc., the largest number of our trades are below the standard of those of other civilized countries; this has special reference to prices, our products are high priced. This latter is not altogether our fault, is in part due to past conditions and the attending results. But if we want to keep abreast of the times, if we want to live and compete with other nations, we must primarily learn to manufacture cheaper and better; we must supply by superior intelligence what has been denied to us by nature in regard to favorable surroundings. The first help must be obtained by a good school education. Our schools are undoubtedly progressive and fully abreast of those of other lands, but when the youth leaves school, what then? Altogether too many take a wrong direction, too many study. If the boy has successfully mastered his readers he is bound to study something at some college or other. The government needs well trained officials, likewise the large industrial establishments; teachers and naturalists need additions to their numbers; we must have doctors and lawyers; there is a demand for engineers, chemists, architects, and builders, all of whom are supposed to stand upon the pinnacle of wisdom. But graduation at a high school is for the average man not only not beneficial, but absolutely injurious. Such studies take up so much time, and lead the mind into channels so different from those useful to the mechanic or tradesman, that the high schools do not in any way prepare him for his future field of activity. The most advanced nations, the Americans and the English, have none of our Austrian high schools; in France we find them in a limited number, used especially for the education of the government officials. Austria has six, France three, England and America have none of such schools. We do not want to say that a mechanic should be ignorant, but that he should be warned that learning and knowledge can be abused. We have people who have studied immensely theoretically, but who are utterly unable to do or to comprehend anything practically, and such people are to be pitied.

> "One glimpse into the book and two into life,
> To train the mind for the coming strife."

A young man who wants to devote himself to a life of activity, should graduate from a common school, serve a certain time for apprenticeship, and then, if possible, go to one of the industrial schools. Such a course carries him into full activity at a time when others are yet at the college; gives him practical business knowledge, and ability enough to be independent at the same time when the college graduate enters life in an utterly helpless condition.

Every young mechanic or business man should learn a great deal, in fact, as much as possible; he should see something of the wor'd by traveling, and thereby accumulate a store of experience and knowledge for a future independent existence, but he must learn from actual contact with his surroundings, not merely from books and lectures.

It is not for everybody to take such a course. Some have not the necessary ability, others lack endurance or strength. These of course will never be able to attain as high a standing, but they can always earn enough to lead a modest existence. They have never known differently and will therefore not be absolutely unhappy. For those who have not the necessary means to push themselves ahead, the technological industrial museums and industrial schools are of the greatest benefit. The beneficial influence of these institutions cannot be over-estimated and is manifested in every branch of modern manufacture.

We most earnestly wish that these institutions may, in the future, receive the full and unstinted support which they so well deserve, and which will allow them to expand and increase their field of usefulness more and more in the education of efficient and active young mechanics. If we attain that end, Austria will always be able to hold her own in the arena of international competition.

AN OPINION.

It is an old axiom in trade says the *Produce Exchange Reporter* that the lower the price the narrower the radius whence supplies are drawn. The attractive force of price resting on the basis of 26 to 40 shillings per quarter in London, is very much less than when prices there are at 40 to 50 shillings. Russia, India Egypt and Chili, are all exporting considerably less wheat than they were at this time last year; while, as previously intimated, the aggregate supply of old grain in the importing is also smaller than one year ago; and, owing to the general apathy in the movement resulting from excessively low prices, stocks in the importing countries are being rapidly depleted.

It may be that opinion will prove strong enough to force values temporarily lower in the event of a favorable American and European harvest; but if it is forced lower, it is safe enough to say that if the new crop in this country is of fairly good quality and condition, it will be marketed very slowly in comparison with former seasons. Ohio, Michigan, Indiana, Illinois, New York, Pennsylvania, etc., will not sell their wheat freely at the equivalent of a less price than is now current in the seaboard markets, since the equivalent of that price will, in consequence of higher transportation, be less next fall than it is now. There apppear to be good reasons for believing that there will be a smaller aggregate area seeded to wheat next fall than there was one year previously.

SCIENTIFIC AND MECHANICAL

WINTER IN THE OLDEN TIME.

THE following statistics of the good old winters are curious. In the year 401, the Black Sea was entirely frozen over. In 768, not only the Black Sea, but the Straits of the Dardanelles, were frozen over; the snow in some places rose fifty feet high. In 822, the great rivers of Europe—the Danube, the Elbe, etc—were so hard frozen as to bear heavy wagons for a month. In 850, the Adriatic was frozen. In 991, everything was frozen; the crops totally failed, and famine and pestilence closed the year. In 1067, the most of the travelers in Germany were frozen to death on the roads. In 1133, the Po was frozen from Cremona to the sea; the wine casks were burst, and even the trees split, by action of the frost, with immense noise. In 1236, the Danube was frozen to the bottom, and remained long in that state. In 1316, the crops wholly failed in Germany; wheat, which some years before sold in England for six shillings the quarter, rose to £2. In 1339, the crops failed in Scotland, and such a famine ensued that the poor were reduced to feed on grass, and many perished miserably in the fields. The successive winters of 1432–33–34 were uncommonly severe. It once snowed forty days without interruption. In 1468, the wine distributed to the soldiers in Flanders was cut with hatchets. In 1684, the winter was excessively cold. Most of the hollies were killed. Coaches drove along the Thames, the ice of which was eleven inches thick. In 1709, occurred one of the coldest winters. The frost penetrated three yards into the ground. In 1716 booths were erected and fairs held on the Thames. In 1744 and 1745, the strongest ale in England, exposed to the air, was covered in less than fifteen minutes, with ice one eight of an inch thick. In 1809, and again in 1812, the winters were remarkably cold. In 1814, there was a fair on the frozen Thames.

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* * Mr. Edmunds' bill creating a forest reservation in Northern Montana, for the purpose of storing and guarding the waters that feed the Missouri and Columbia rivers, has passed the senate, Boston papers tell us. The preservation of these noble forests of the Rocky Mountains against all inroads of so-called civilization, is an eminently wise and proper measure. It has the support of the men whose advice upon such subjects is best worth following, while the importance of establishing such a reservation has been vigorously urged upon congress by President Arthur. It only remains, therefore, for the house to take up the Edmunds bill, and act upon it promptly and intelligently. The withdrawal from sale and public entry of the great forest region, will be the first official recognition by this country of the importance and value of the forest as a regulator and preserver of rivers. It will be the first real step, too, ever taken in the United States toward the establishment of a comprehensive policy of forest preservation and management. Mr. Edmunds' bill cannot become law a day too soon.

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* * Recent experiments made at the works of a French firm at Sainte Marie-aux-Mines, are of some interest as bearing upon the question of relative efficiencies of plain and ribbed steam-pipes for heating purposes, we are told by the *Metal Worker*. In the case in question, two drying rooms were heated by steam circulating in ten cast iron ribbed pipes, 6.56 feet long, joined with four plain bends. The pipes were 4¾ inches in diameter internally, and .43 inches thick, thus making an external diameter of 5.6 inches. The ribs were circular, eleven inches in diameter, extending, consequently, 2.7 inches from the surfaces of the pipes, and were arranged with a pitch of 1.38 inches. The total surface of one of these pipes was 58.5 square feet, of which 50.75 square feet were presented by the ribs. For ten pipes, including the four bends, there was, therefore, a radiating surface of 603 square feet, while with plain pipes only 114 square feet would have been available. Comparing the results of six hours tests with those deduced by Mr. Peclet from the action of plain pipes, it appears that the condensing performance of the ribbed pipes is four and a quarter times as much as that of plain pipes of equal diameter and length would have been. Lower first cost of the ribbed pipe, and also lower cost for maintenance as compared with that for wrought-iron pipe, are, moreover, points which deserve attention, and make it appear somewhat peculiar that its various advantages have not been more widely appreciated.

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* * One of the simplest and readiest methods of loosening a rusted screw is to apply heat to the head of the screw. A small bar or rod of iron, flat at the end, if reddened in the fire and applied for two or three minutes to the head of the rusty screw, will, as soon as it heats the screw, render its withdrawal as easy by the screw-driver as if it were only a recently inserted screw. As there is a kitchen poker in every house, that instrument, if heated at its extremity and applied for a few minutes to the head of the screw or screws, will do the work of loosening; an ordinary screw-driver will do the rest, without causing the least damage, trouble or vexation of spirit. In all work above the common kind where it is necessary to use screws, and particularly in hinge work and mountings, fancy fastening and appliances affixed to joinery or furniture work, we would advise the oiling of screws or the dipping of their points in grease before driving them. This will render them more easy to draw and also withdraw, and it will undoubtedly retard for a longer time the action of rusting.

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* * We notice that at last wood-paving is being most extensively adopted in the French capital. The Paris Municipal Council has just approved plans for laying it down in nineteen more great thoroughfares:—The Rues des Tuileries, de la Paix, de Castiglione, de Medicis, and de Bourgogne; the Boulevards de Palais, Saint-Germain, Saint-Michel, Hausmann, Malesherbes; the Avenues des Gobelins, Friedland, Marigny, d'Antin, and Montaigne: the Places Vendome, de l'Opera, de la Concorde, and the Quai d'Orsay. Although in municipal matters generally the French have been, certainly in organization, ahead of us, says the *Building World*, London, they have had nothing to teach us in paving, a thing woefully behind the age on the Continent, but still in keeping the streets of the capital and of large towns clean, the French excel us and all our water carts. Why should the city of London so soon as ever a little rain falls become a wilderness of mud, destructive alike to clothes and temper.

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* * The Senate in executive session, on June 13, ratified the treaty for the protection of trade marks between the United States and Denmark. Adverse action was taken on the proposed accession of the United States to an international convention of industrial properties, signed at Paris in 1883. The last named is better known as the patent rights treaty. It was not approved by the Patent Office authorities, and was reported adversely by the Senate Committee on Foreign Relations. It was held that its ratification would cause radical changes in the American system of patent laws, and would confer no adequate benefits in return. The benefits resulting to patentees by the ratification by countries where the system of patent laws was less liberal were considerable, but they already enjoyed, it was said, equivalent advantages under the American patent laws. Twenty-four governments have ratified and promulgated the treaty thus rejected by the Senate.

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* * Dr. E. H. Bartley, chemist of the Brooklyn Health Department, presented Commissioner Raymond with a pigment called "Dutch pink," which he obtained from the works of the New York and Baltimore Coffee Company last week. He was informed by the foreman, he said, that it was a new color that they received as a substitute for the "chrome orange" that had been discarded. Upon making a partial analysis of the pigment, he found that it contained chromate of lead and arsenic, mixed with yellow ochre, and he advised the Commissioner to prohibit its use in the coloring of coffee. Commissioner Raymond, who at once communicated with the company, was informed that the coloring had not been used, and would not be.

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* * Some Russian botanists, we are told, claim to have discovered that the silky fiber found within the seed vessel of the epilobium or willow herb possesses many of the qualities of cotton fiber. This material has been ginned, spun and woven successfully on a small scale. An economic society in St. Petersburg has petitioned the Czar to set aside some state lands for the scientific cultivation of the plant and for the continuation of experiments for improving the fiber. There are several species of willow herb, and this country is provided with a plentiful wild supply. It might prove profitable to some inquiring individual with the time and money at his disposal to endeavor to improve our native species.

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* * Pasteur is being overwhelmed with letters from persons offering their services as subjects for his experiments in inoculating human beings against rabies. The experiments are to be made before a government commission, and among the persons who offer to submit their persons to the interests of science, are no less than four medical students, who beg to be given the preference, as they are willing, if need be, to die in what they all pronounce "the cause of humanity."

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* * A statement of the aggregate traffic over the New York Elevated Roads shows marvelous figures. During the first year the roads carried 170,000 persons, and during the past year nearly one hundred millions. The first year's earnings were $17,000; last year nearly $7,000,000. There was steady progression each year. The aggregate earnings since the first road was built, in 1872, were $32,000,000. The aggregate passengers carried 444,000,000.

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* * Sixty cigars for every man, woman, and child were made in and imported into this country last year.

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* * Minnesota has 7,000 lakes which take up 2,600,000 acres of territory.

The Milling World's Observatory

WORRIED WING.

THE PLANET MILLS IN TROUBLE

THE D. L. WING MILLING COMPANY, OF LITCHFIELD, ILL., TEMPORARILY EMBARRASSED.

The St. Louis *Globe-Democrat* of the 21st, said: There was considerable excitement occasioned in the flour corner on 'Change yesterday morning, first by the statement that D. L. Wing had leased his "Planet" mills at Litchfield, Ill., to A. H. Stonebraker, of Houseman, Stonebraker & Co., and later by the rumor that Mr. Wing had failed. D. R. Francis was said to be one of his largest creditors, but a visit to that gentleman developed the statement that he only held a mortgage on cooper stock belonging to the Wing Milling Company, on which he had loaned $14,000.

"I was very much astonished," said Mr. Francis, "to hear that Wing had leased his mill, and I even denied it at first, but later I met Mr. Stonebraker and he confirmed the rumor. I have since seen Mr. Orrick, Mr. Wing's attorney, and he says my mortgage is perfectly good."

When questioned about the statement that the mortgage had some connection with the sale of 213,000 bushels of wheat made by him to Wing in February last, Mr. Francis said that the day after the trade was made, he had offered Wing $1,000 to cancel it. Wheat had since gone off a good deal, but Mr. Wing had told him he had sold every barrel of flour made from that wheat at a profit. Mr. Francis stated that he was not involved further than the $14,000, for which he had ample security. He also said that the Laclede Bank did not hold a dollar of Wing's paper which was not secured.

Mr. W. H. Thomson, cashier of the Boatmen's Bank, through which the Wing Milling Company did most of its business, stated that he thought the bank was fully secured on all the paper it held. Some of Wing's drafts had come back, but they had bills of lading attached, and were fully secured in that way. Said Mr. Thomson: "Mr. Wing came from Springfield, Mass., where he was formerly a partner in the firm of Downing, Sturtevant & Wing. Mr. Downing, as I understand it, was interested with Wing, to a certain extent, in the mill. At any rate, Mr. Wing has checked on him for large amounts. A short time since Mr. Wing showed us Mr. Downing's authority to draw on him for $40,000, and proceeded to make drafts, the first of which amounting to $18,500, were paid and the remainder accepted. Then, Mr. Downing refused to pay his own acceptances. I suppose he found money rather tight, and perhaps Wing had exceeded his instructions; but as the drafts are accepted by Downing, of course we can recover from him. As to Downing's responsibility, the Chaplin National Bank of Springfield, reports him to be worth $200,000, and the Third National Bank of Springfield, say he is worth $100,000, aside from his business interests. My understanding of the matter is this: The Wing Mill Company own a plant costing, as Mr. Wing has told me, $400,000, and which, I am assured by experts, would bring $250,000 under the hammer. I understand their liabilities are about $120,000, aside from a bonded indebtedness of $150,000. These bonds are held as collateral by different parties. My idea is that no one will lose any money by Mr. Wing. He has simply been trying to run a large business on a comparatively small capital, and failed to make both ends meet at the proper time."

Mr. J. C. Orrick, Mr. Wing's attorney, seemed to take a more serious view of the case. The bonded indebtedness, he said, was $225,000, all of the bonds being held as collateral, principally by parties in the East. The mill had cost in all over $350,000, and the capital stock of the company was $400,000, of which he thought Downing owned two-fifths. About a year ago Mr. Wing, having had a prosperous season, determined to enlarge the capacity of his mill and spent, probably, $150,000 in doing so, only to meet with a dull season and a series of losses which has been the prevailing feature of the milling business for some time. The only paying month of the year—October—the Planet broke down and lay idle for thirty days, causing a loss on contracts on hand of fully $30,000.

"I think, however," said Mr. Orrick, "that even with these difficulties he could have gotten through all right if he had not invested in a railroad. He had some litigation with the Wabash about switching, and, as a result of it, he started a road of his own with the idea that after he had got it started others would come in and take part of the burden off his shoulders. The road was to run from Springfield to Litchfield and down toward St. Louis, and was started about a year ago. Since that time Wing has sunk about $100,000 in the enterprise."

"At what amount would you place the drafts accepted by Downing?"

"I think they would aggregate over $100,000."

"Is he good for the amount?"

"I think that is one of the things Wing has gone East to inquire into. As soon as he heard his paper had gone to protest he went on to see Downing and find out just how he stood."

"What is Mr. Wing's indebtedness?"

"I can only guess at it, but I suppose it may amount to $25,000, outside of $225,000 bonded indebtedness and the $100,000 of Downing's acceptances. The mill when sold will, I think, about cover the amount of the bonds."

"Has any other paper of Mr Wing's been protested?"

"There is some in the East, which is also indorsed by Downing, and has been placed by him. The amount of it I do not know."

"Did Mr. Wing ever hold Mr. Downing's blank acceptancess?"

"As Mr. Wing's attorney I am not at liberty to speak on that subject. Mr. Wing has gone East to arrange matters with Mr. Downing and borrow some money on his railroad. If he succeeds in this I think there is no doubt that he will pull through."

The question, however, which seems to be agitating the minds of the public and the banks is whether Mr. Downing can protect his acceptances. It certainly seems strange that a business man in good circumstances should be unwilling, if able, to pay his own acceptances. Then if Mr. Downing has been placing paper in the East there is no telling how much may be out, and if Wing has held blank acceptances of Mr. Downing there may be any amount of these drafts as yet unaccounted for. It is evident that Mr. Wing knew that his paper was going to protest, for he stated to Mr. Francis several days ago that he was going to New York to meet a man on Saturday. The Laclede Bank, which holds about $30,000 of this Wing-Downing paper attached Mr. Downing's property in Springfield, Mass., several days ago, while the Boatmen's is said to be very slightly involved and, according to Mr. Orrick, most of the loss, if Downing should fail to meet his obligations, will fall on parties in the East.

With regard to the leasing of the mill to Mr. Stonebraker for a year, both Mr. Thomson and Mr. Orrick expressed the opinion that this was done to protect the plant from any small creditor who might wish to swoop down and attach the property. Mr. Stonebraker expresses his intention of forming a stock company and operating the mill immediately.

D. L. Wing went to St. Louis from Springfield, Mass., in the spring of 1881, and built the Planet Mills at Litchfield, with a nominal capacity of 1,000 barrels per day, which was afterwards increased to 2,000. The actual output was about 1,700 barrels. At the time of the opening of his new mill he gave an excursion to his friends on Change, treated them to a collation in the town hall of Litchfield, and brought them back to St. Louis about midnight. Mr. Wing made quite an effort at one time to obtain the city trade, but failing, confined himself to New England and Southern shipments. He is also said to have quite a large trade abroad, and was accustomed to sell entirely on order. Both Mr. Orrick and Mr. Francis state that Mr. Wing has lost nothing by speculation, and his misfortunes have been entirely due to the dullness of the flour trade.

Notes from the Mills.

Kauffman Milling Co., St. Louis, Mo., has bought a Gray noiseless belt roller mill.

Schiminke & Reiber, Nebraska City, Neb., have placed their order for a Gray noiseless belt roller mill.

A. J. Kuhn, Columbia, Tenn., has purchased four pair Allis rolls in Gray's noiseless belt frames.

Elkhorn Mill Co., Boonville, Ind., are using eight pairs Allis rolls in Gray's noiseless belt frames, etc.

R. A. Willing, Phelps, N. Y., has bought of E. P. Allis & Co., eight pairs Allis rolls in Gray's noiseless belt frames.

Thos. Bradford & Co., Cincinnati, O., have ordered two "Little Giant" break machines from the Case Mfg. Co., Columbus, O.

One No. 1 double purifier, for E. C. Enson New Windsor, Md., was lately shipped by the Case Mfg. Co., Columbus, O.

Loomis' mill, near Little Rock, Wis., was wrecked by an explosion last week, two men being killed and two others seriously wounded.

Mann Bros., Milwaukee, Wis., are putting in an 18x42 Reynolds Corliss engine, purchased of E. P. Allis & Co., Milwaukee, Wis.

J. B. Ficklin, Fredericksburg, Va., has lately received six pairs of rolls, with patent antomatic feed, from the Case Mfg. Co., Columbus, O.

The Moore Combination Desk Co., of Indianapolis, Ind., have ordered a 14x42 Reynolds-Corliss engine, of E. P. Allis & Co., Milwaukee.

Levenhagen & Petrie, Mishicott, Wis., will soon start up, using five pairs Allis rolls in Gray's noiseless belt frames, and other special machinery.

The Case Mfg. Co., Columbus, O., have an order from E. W. Newton, Adams Station, Tenn., for two pairs of rolls with patent automatic feed.

Jos. R. Gebhart & Son, Dayton, O., have ordered two additional pairs of rolls with patent automatic feed, from the Case Mfg. Co., Columbus, O.

Rosecrans, Wertz & Eckley, Sigourney, Ia., have given an order for a No. 2, four-break machine, and four pair Allis rolls in Gray's noiseless belt frames.

Quite extensive improvements are being made in the Jarrett mill, Wabasha, Minn. The dam is being raised and repaired and four new rollers are being put in the mill.

Wm. Farrell, Carlinville, Ill., has ordered from E. P. Allis & Co., a complete roller mill plant, and will use twenty pairs of Allis rolls in Gray's noiseless belt frames.

The Riverside Printing Co., of Milwaukee, Wis., making extensive improvements, are putting in an 8x24 Reynolds-Corliss engine, made by E. P. Allis & Co., Milwaukee.

The Case Mfg. Co.. Columbus, O., have lately taken the order of R. F. Allen, Fond du Lac, Wis., for five pairs of rolls with patent automatic feed, centrifugal reels, scalpers, &c.

Rooseveet Bros., Ackley, Ia., have bought of E. P. Allis & Co., eight pairs Allis rolls in Gray's noiseless belt frames, and other machinery necessary to equip their mill on the roller system.

The Union Elevator Co., Kansas City, Mo., have recently ordered a new 18x42 Reynolds-Corliss engine, and complete power outfit from E. P. Allis & Co., of Reliance works, Milwaukee, Wis.

Johnson & Toland, Vermont, Ill., have given an order for four pairs rolls with automatic feed, one No. 1 double purifier, and one "Case" improved centrifugal reel, to the Case Mfg. Co., Columbus. O.

E. Middletown & Sons, Greenville, Mich., have ordered of E. P. Allis & Co., all the machinery to double the capacity of their present (Allis) roller mill, including twenty-six pairs of Allis rolls in Gray's noiseless belt frames, etc.

The Case Mfg. Co.. Columbus. O., have an order from the W. A. Huffman Implement Co., Fort Worth, Tex., for a pair rolls one No. 1 double, and one No. 2 single purifier with patent automatic feed and one centrifugal reel.

The Lucy Furnace Co., Pittsburg, Pa., have recently placed an order with E. P. Allis & Co., of the Reliance Works, Milwaukee, Wis., for a Reynolds patent automatic cut-off blowing engine, steam cylinders 42x60, air cylinders 84x60.

The Case Mfg. Co., Columbus, O., have been awarded the contract of D. Marracong, Evansville, Wis., for eight pairs of rolls with patent automatic feed, purifiers, scalping reels, &c., for a full gradual reduction mill on the "Case" system.

There are three flour mills in Mankato, Minn., the largest is a 500-barrel mill, four stories, built of brick, and has invested over $160,000. The mill is 72x74 feet, engine and boiler room 54x64. A 250 horse-power engine is the propelling power.

South Lyons Milling Co. Limited, South Lyons, Mich., have contracted with E. P. Allis & Co., for a complete roller outfit with eleven pairs Allis rolls in Gray's noiseless belt frames. Also a 12x30 Reynolds-Corliss engine, with boiler, etc., for power outfit.

Besides the new 600-barrel flour mill being erected at Fergus Falls, Minn., by a company of which Hon. Henry G. Page is at the head and with a capital of $100,000 another mill will also soon be built, upon the George B. Wright water power, thus making five large roller mill at that point.

The L. C. Porter Milling company of Winona, Minn., have broken ground for a new engine and boiler house at the north end of the mill in which they will place four new boilers. The size of the engine and boiler house when completed will be 40 by 100 feet. An engine bed will be constructed for future use. The flouring mill is running to its full capacity turning out upwards of 600 barrels a day, and is kept constantly busy filling its orders.

Deaninger Bros., Adrian, Mich., remodeled their old "Red Mills" to the "Case" gradual reduction system. The Case Mfg. Co., Columbus, O., furnishing all machinery. They have been running the mill successfully for about eighteen months, and have been so well pleased that they have again contracted with the Case Mfg. Co., for a complete outfit of breaks, rolls, purifiers, centrifugals, scalpers, &c., for a full gradual reduction mill on the "Case" system using ten pairs of rolls with patent automatic feed. This being the second order for a full mill from the same firm shows plainly that they are highly pleased with the "Case" machines.

DOMINION NOTES.

The *Nor' West Farmer* gives the following notes:

The grist mill at Minnedosia has again changed hands.

The oatmeal mill at St. Leon is fast approaching completion.

The Ogilvie Milling Co. will erect a 40,000-bushel elevator at Morris this season. This company will also enlarge their elevator at Manitou at the end of the C. P. R. southwestern track.

Business at the Winnipeg mills has been good during the past month. The opening of lake navigation has given an impetus to export work. About four cars a day have been shipped eastwards via Port Arthur.

The Bell Farm Co. have, we understand, decided to erect an elevator at Indian Head Station to hold 50,000 bushels. The plans are being prepared by Mr. C. W. Stewart, architect, Winnipeg. The structure is to be a model elevator for northwestern requirements.

It has been decided to rebuild the Hudson's Bay Company's steam mill recently destroyed by fire at Prince Albert. A gang of men are already in the woods at Edmonton getting out the timber; new machinery will be ordered at once, and it is the intention to have the mill, which combine all modern improvements, in running order by the first of September.

Mr. James Franks of the Primitive Methodist colony, north-east of Indian Head, Manitoba is making preparations for the erection of a flour mill, which he expects to have in operation in autumn. He has been many years in the milling business in Leicestershire, England, and the residents of the colony have every confidence in his ability as a miller and will undoubtedly give a good bonus to encourage this enterprise.

Mc Millan's mill at Winnipeg has lately been enlarged and a great amount of the latest improved machinery added, which makes its flour equal if not superior, to the best make of Minneapolis mills. The improvements were superintended by Mr. Cook, a well-known expert of Minneapolis who says that, if all the wheat in Manitoba is as good as that in Mc Millan's elevator, it will discount anything he has seen from Minnesota or Dakota.

Mr. Stephen Nairn, of Toronto, has removed to Winnipeg for the purpose of erecting and operating an oatmeal mill. The mill will be built on the lot owned by Mr. Nairn adjacent to Ogilvie's mill on the C. P. R. track. He purposes putting in machinery capable of turning out the highest class of meal suitable for home consumption and export. This will add another to the industries of the city and will create an additional demand for oats. He asked the Winnipeg City Council to exempt him from taxes for five years. The mill will cost in the neighborhood of $15,000 and will have a capacity of 100 barrels per day. This, we understand, will be the first mill of the kind in that province.

The Mill Furnishing Trade.

W. J. CLARK & Co., Salem, Ohio, carry a stock of a quarter of a million wooden conveyor-flights of all sizes, and can promptly fill all orders at low prices. Write them for samples, and see what they will send you.

THE M. F. KOCH MFG. CO., of 63 Prince Street, New York City, have secured control of the patents of the late Dr. Wm. H. Allen, M. F. Koch and Jos. T. Bedford, relating to grain weighing and registering machines, and are now prepared to fill orders, guaranteeing the satisfactory performance of their machines under every circumstance. They invite correspondence from millers and will take pleasure in replying to all inquiries.

From Foreign Lands

BRITISH GRAIN SUPPLIES.

THE London *Miller* recalls that deliveries of English wheat must be expected to diminish rapidly very soon. Foreign arrivals, however, are expected to be full in view of the quantities known to be on passage as well as the somewhat liberal shipments from exporting countries in May. Regarding the latter, "fresh shipments" during the current cereal year will, of course, depend largely on the length of passage. But little California new crop wheat is expected in the United Kingdom before Oct. 1. Excepting that which is on passage from Australia and New Zealand, no more from there is likely to enter into receipts of 1883–84. There will be however, (June 1) eight weeks' more arrivals from the Atlantic ports. Russia will have eight weeks' shipments to count in the British receipts of 1883–84, and there will be six weeks of India steamer shipments. In discussing this question the London *Miller* says that the following will not unfairly represent British supplies for the last quarter of the cereal year ending Aug. 31:

	Qrs.
Stocks of foreign wheat and flour, say	3,000,000
Farmer's deliveries, say 125,000 qrs. for five weeks, and 100,000 qrs. for the remaining eight	1,425,000
Wheat and flour on passage to arrive before the end of August, about	2,000,000
Eight weeks' shipments from the Atlantic ports at 70,000 qrs. per week	560,000
Eight weeks' shipments from north and south Russia, at 50,000 qrs. a week	400,000
Six weeks' shipments by steamer from India and Russia at 50,000 qrs. weekly	300,000
Egyptian, German and miscellaneous	290,000
Total	7,935,000
Full wants	6,370,000
September 1—Reserves	1,565,000

Summer wants are not, however, by any means so large as those of winter, and it is therefore probable that the old cereal year will have nearer 2,000,000, than 1,565,000 quarters to hand over to the new campaign. This will be sufficient, but it will give the new ceral year a much better chance than was afforded to 1883-84, which had to take over 4,500,000 of wheat and flour accumulated in the United Kingdom by the too confident buyers of the previous year.

GERMAN SHIPPING INTERESTS.

The striving of Germany specially during the last four or five years, to extend her trade in Africa, Asia and Australia received a fresh impulse by the crisis in the United States says the Berlin correspondent of *Bradstreets*. As production cannot be diminished in general without great damage to the German population every effort must be made to make up in some other portion of the world for the loss in one part. A bill laid by the Chancellor before the Bundesrath, concerning the subvention of transatlantic German steamer lines by the empire, is therefore not likely to be declined by the Reichstag, when the expected decrease of exportation to America is taken into consideration, whatever economical and political objections may be raised. The Chancellor's bill intends to confer the establishment and management of regular steam postal lines, *a*, between Hamburg or Bremen and East Asia, *b*, between Hamburg or Bremen and Australia for fifteen years, to private institutions, granting in the contracts subsidies up to 4,000,000 marks ($1,000,000) yearly from the empire. For the traffic with East Asia is proposed, *a*, a principal line from Hamburg or Bremen to Hong Kong via Rotterdam or Antwerp, Naples. Port Said, Suez, Aden, Colombo, Singapore; *b*, a branch line between Hong Kong and Yokohama via Shanghai, Nagasaki and some port in Corea.

For the traffic with Australia, *a*, a principal line from Hamburg or Bremen to Sidney via Naples, Port Said, Suez, Aden, King George's Sound, Adelaide and Melbourne; *b*, a branch line from Sidney via Auckland, Tonga Isles, Samoa Isles and Brisbane back to Sidney. The post bags are to be given or delivered in Naples. The voyages on the East Asian and Australian lines are to be monthly. The memorandum added to the bill states that the lack of German steam lines to East Asia and Australia is felt more and more, and hopes are entertained from the creation of the projected lines that a considerable increase in German trade with those parts of the world will take place.

NOTES.

The Muenz mill at Langensalza, Germany, was destroyed by fire May 20.

Lightning damaged the windmill of Mr. Behnke, in Friendland, Mecklenburg, on May 21.

London advices report that the deliveries of British wheat have become quite scanty, and the price of offerings for wheat has not gained.

The Clerical party in the German Reichstag has formally decided to insist upon an increase of duties upon grain imported into the empire.

The recent earthquake shock in England caused a rise of seven feet in the water of the wells of Colchester. The rise is apparently permanent.

Some of the large flour importers in Great Britain are complaining of the very poor quality of the sacks in which much of the American flour is now shipped.

A mutual cattle insurance office has been started in France. It insures all beasts not more than 15 years of age against mortality and accidents of whatever nature.

The Madrid *Imparcial* states that nine flour mills in the province of Valladolid have been closed within a month, and that nine other mills in the same province are about to be closed.

The German bundesrath has adopted a bill to subsidize transoceanic steamship lines. The government is authorized to grant private companies concessions to organize and maintain regular mail steamer services between Germany and ports of Eastern Asia and Australia.

The rage for speculation appears to have had disastrous results of late elsewhere than in the United States. The liabilities of two bankrupt houses on the Bourse at Pesth, Hungary, amounted to 8,000,000 florins. In both cases there were no personal assets, they having been enabled to enter upon their engagements by the credit granted them by various institutions.

Austrian journals state that the competition between American and Indian grains makes itself felt in their markets. The crop failures in Bohemia last year induced the millers of that section to import American and Russian grains. Now we are told from Prague, that several samples of Indian wheat are on the way for Bohemia, ordered especially by North Bohemian and Prague mills.

The *Egyptian Statistical Tableau* for 1883, published by Messrs. R. J. Moss & Co., of Alexandria, shows that Egypt is an important, though irregular, exporter of wheat. Thus, in 1868 the exports were 6,215,000 bushels, and in 1870, only two years later, they had fallen to 85,000 bushels. In 1879, again, they amounted to 6,365,000 bushels, whereas last year they had shrunk to 3,070,000 bushels.

The total number of failures in the United Kingdom and Ireland reported to Kemp's *Mercantile Gazette* for the week ended May 31 was 78 as compared with 233 and with 164 respectively during the concluded week in May, 1883 and 1882. The total in England and Wales is 59 as against 209 and 147, and in Ireland 3, as compared with 3 in the last week of May, 1883, and none reported in a like portion of May, 1882.

The milling establishment of Mr. H. Bruck, at Loebschuetz, Germany, took fire on May 21, and, in spite of the exertions of the fire department, the whole mill was totally destroyed. Fortunately a heavy brick wall separated the storehouse from the mill, and the iron doors which connected the two, performed their duty admirably, and saved the large stock of grain and flour. Steps to rebuild the mill have been taken immediately, and it is expected that operations can be resumed some time in the autumn.

The annual meeting of the Association of German Millers was held at Breslau this year, beginning on June 22 and ending June 25. An exhibition of milling machinery and tools was to be held in connection with the meeting. *Die Muehle* gives a description of Breslau for the occasion, calling attention to the many points of interest found within the city and its surroundings, from a historical, as well as commercial and social point of view. The programme of the meeting promises a pleasing variety of official business and social pastimes, and the milling fraternity of Germany will undoubtedly remember with pleasure their meeting at Breslau.

In Russia there has just been raised a loan of £15,000,000 sterling for railway purposes, and, so far as it can be exactly ascertained, it would seem that this large sum has been already half expended, and that the other half is intended for the carrying out of works long since projected, such as the extension towards Siberia, by the Tumen line, the opening up of the Donetz coal district, the Krevie Rot iron district, the Bashkunchasky salt district, &c. But to put all the railways now lingering for funds into a proper position, at least another such loan is required, At the present time the whole length of railways open in Russia is 22,211 versts, and adding 1,107 versts in Finland, and 217 on the eastern side of the Caspian, there are only, in this large empire 23,535 versts, or 16,000 miles.

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THE Grain and Flour Trade

Office of THE MILLING WORLD.
Buffalo, N. Y., June 25, 1884.

In the grain and flour markets there is nothing to report of a noteworthy character except possibly greater dullness and unstable values. The New York *Commercial Bulletin* of yesterday says: Numerous influences combined to weaken the situation. The unsettled conditions of affairs in Wall street was enough in itself to dissipate any hope of a change for the better, inasmuch as it is conceded on every hand that as long as liquidation goes on in financial quarters it will be impossible to secure any stability in commercial values. The truth of this position had full demonstration in the course of the grain, provisions and cotton markets, all of which were decidedly lower. Another fact against the grain markets has been the bearish purport of the foreign advices. Exporters have done but little. The scarcity of spring wheat on the spot has made it possible for holders to get 96½c. for a load to-day, while for next week's delivery there were sales at 95¼c. and 94¾c. was all that could be got for delivery ahead. No. 2 red winter sold at $1.00½ delivered. The general market for actual wheat shows a decline of 1@1½c. per bushel; 96½c. for prompt delivery No. 2 Chicago spring, obtained to-day, being, of course, a fancy price. A load of No. 1 hard Duluth sold at $1 09, spot delivery; no inquiry for future delivery Duluth.

The weather and crop news has been good generally, but good news on these subjects is generally discounted and fails to have any decided bearings on the market. News on the weather and crops of an unfavorable tenor would find the market in a position to respond sharply. The speculative side of the market has been destitute of features here, but the news from the west has been anything but assuring.

The price of city milled flour is $5.05. The tropical demand is large enough to keep the city mills comfortably busy, but nobody seems to be pushing for business. State and Western flour of whatever grade or complexion is very dull. A look across the long tables is enough to show that the attendance of buyers is very small, and that samples are attracting but little attention. The quotation list shows but little actual change in values, but for all that, sales are going on at very irregular prices, and at prices which give the advantage to the buyer every time where the necessities of the case force selling. So much flour is being held at quotations, however, and the condition of the makret is so generally nominal, that it would be hardly fair to take the occasional forced lots as a criterion for the whole market. Some are disposed to call the general market 10c. lower. Southern flour is equally dull and nominal. Rye flour is scarce and therefore firmly held; $3.75@3.90 for the general run and $4.00 for occasional lots of very fancy stock. Corn goods are steady but quiet; white goods continue scarce; demand is generally slow. Bag meal is quiet and rather easier. Mill feed is in moderate demand and moderate supply.

BUFFALO WHEAT MARKET.

Buffalo, June 24, 1884.

Our wheat market during the month has been in a very chaotic state. The farmers in the interior of the state are delivering the wheat they have been holding all winter for higher prices, consequently our market is flat. There is some little demand for good white wheat, but good samples are scarce. Our milling white, which corresponds to No. 1 White Michigan, is held at $1.02½, but has been sold at $1.00; 98c bid on Call Board. No. 2 red winter is held at $1.00, but would be sold much lower if a purchaser could be found. There is quite a demand springing up for our Northern Pacific wheats for the export trade. No. 1 Regular, or the soft variety, seems to be the favorite grade, though No. 1 and 2 hard have also been sent abroad.

There has been shipped from Duluth since the opening of navigation about 498,000 bushels, and from here since May 26th, 490,787 bushels, all for the export market. No. 1 hard Duluth sold yesterday at $1.04, and 5,000 bushels to arrive at $1.03. No. 2 hard is held at 97c. Our local millers are buying very sparingly, and looking for still lower prices. No. 2 corn is selling at 60@60½c, good feed corn 55c, and other grades from 53@58c as per sample. No. 2 white oats are selling at 37c, and mixed western at 33@36c.

The report from all the states and the Agricultural Bureau promises the largest wheat crop ever raised in this country. This, with the near approach of the harvest, has a depressing effect on the market, and unless the weather proves unfavorable to the harvest crop, much lower prices must prevail to enable this country to dispose of its large surplus.

JAMES S. MCGOWAN & SON.

BUFFALO MARKETS.

FLOUR—City ground clear Duluth spring $5.25@5.75; straight Duluth spring, $5.75@6.00; amber, $5.75@5.85; white winter, $5.50@5.75; new process, $6.75@7.00; Graham flour, $5.25@5.50. Western straight Minnesota bakers, $5.75@6.00; clear do, $5.25@5.75; white winter, $5.75@6.00; new process, $6.75@7.25; low grade flour, $2.50@400. CORNMEAL—Market steady, with a fair demand. Coarse, $1.20; fine, $1.30 per cwt. RYE FLOUR—In fair demand at $3.75@4.25. OATMEAL — Ingersoll, $5.75; Bannerman's granulated, $6.00; Schumacher's Akron, $6.25 per bbl. BUCKWHEAT FLOUR—Demand fair at 3.50 per cwt. WHEAT—Weak. Sales 5,000 No 1 hard Northern Pacific at $1.03 July; offered at $1 04 cash, $1.04 asked, $1.03 bid June; $1.06 asked, $1.04 bid August; $1.07 asked September. Milling white offered at $1.00, and No. 2 red at 98c. CORN—Steady. Sales two carloads new high mixed at 59c, and eight do. new mixed at 57⅜@58c. No. 2 offered at 60c in store. At the Call Board 60c asked. 59c bid July, and 60c bid Aug. OATS—Weak. Sales one car-load mixed at 36c on track. No 2 white at 36½@37½c. BARLEY—No. 1 Canadian 88@90c, No. 2 do 80@83c, No. 3. do 70@75c, six-rowed State 75@78c. RYE—No. 1 Western nominal at 72c.

FOREIGN EXCHANGE.

The market for sterling has been depressed by offerings of bills against stocks bought here for London account, and, as buyers have not been plenty, rates have ruled very irregular. Posted rates were reduced 1½ cents, 4.83½ for sixty days, and 4.85½ for demand. Actual rates were as follows: Sixty days', 4.82@4.83; demand, 4.84@4.85; cables, 4.84½@4.85½; commercial bills, 4.80@4.81. Continental exchange was very dull, but rates have ruled steady; francs, 5.20⅝@5.20 and 5.18⅞@5.17½; reichsmarks, 94⅝@94¾ and 95⅛@95¼; guilders, 40@40¼. The closing posted rates were as follows:

	60 days.	30 days.
London	4 83½	4 85½
Paris francs	5 18⅛	5 15⅝
Geneva	5 17½	5 15
Berlin, reichsmarks	95	95⅝
Amsterdam, guilders	40⅛	40⅜

NOTES.

The grain elevators at Baltimore are now with very reduced stock, the late shipments having exceeded the receipts of both wheat and corn. There will be ample room for the new wheat crop when ready for forwarding.

The elevator of G. P. Russell, at Eyota, Minn., has a new ten-horse power engine. The cost of the improvements will be about $1,000. Mr. Russell handles the most of the grain at Eyota, which necessitates increasing facilities.

There were shipped to foreign ports from New Orleans during the month of May past 778,097 bushels corn, but no wheat. May, 1883, the shipments from that port were 1,282,457 bushels corn and 35,092 bushels wheat—a decrease of 504,360 bnshels corn and 35,092 bushels wheat,

Building of the new elevators has already begun by the Farmers' Union Elevator Company, of Minnesota. At Sabin the structure is rapidly rising. Lumber is unloaded on the site of the new house in Glyndon, south of the Northern Pacific track, opposite Bangs & Co.'s warehouse. Material ia on the ground or in transit for the elevators at Barnesville, Kragness, Carman, Angus, Argyle and Stephen. Each house is to be of 30,000 bushels capacity, built in crib fashion, and requires 120,000 feet of lumber.

The latest returns to the Illinois department of agriculture dated June 14, give a more discouraging outlook for the growing crops than the one a month ago. In the central and southern division there is much complant of the appearance of large amounts of chess. In the northern division there is a prospect for 94 per cent of an average crop, in the central, 77; in the southern, 64. In average seasons over one-half the winter wheat crop of the State is produced in the southern district, and the partial failure of one-third the average yield per acre will greatly reduce the crops of the State.

The wheat crop throughout the Northwest, according to the Winnipeg *Sun*, could not look better. The farmers who looked for a night or two of nipping frost about the first week in June have been agreeably disappointed. In Southern Manitoba the crop is fully a month ahead of last year's in June. A prominent miller says that according to the present outlook there will be 3,500,000 bushels of wheat in the Northwest for export next fall. But the cash value of the crop is not the only consideratlon. A good crop will "boom" the country abroad as well as put heart into the settlers already there. A Liverpool house proposes sending an agent to Manitoba this fall to make purchases on the spot.

The annual report of the Commissioner of Statistics gives some interesting facts regarding the changes taking place in Minnesota agriculture. The change is the favorable one from a single crop to diversified products. In 1881 the total area devoted to wheat culture was 2,884,160 acres; 1882 it had decreased to 2,329,969, notwithstanding the fact that the area under cultivation had increased by more than 436,000 acres. The gradual abandonment of the old system is apparent from the fact that in 1878 the percentage of the total area sown in wheat was 68.98; in 1879 it was 68.30; in 1880, 66.59; in 1881, 62.49, and in 1882, 53.35, or only a trifle over one-half of the cultivated area. At the same time the acreage in oats, barley and corn has correspondingly increased from 24.89 per cent in 1878 to 37.89 in 1882. The history of Minnesota is that of other Western States. In the beginning, wheat is the easiest crop to raise. As the country grows older and fills up, and the farmers get means, they see the danger of relying on a single crop, increase their cattle, and so, gradually, get into the better way.